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NPIC/TSSG/TPD/842-68
3 October 1968

ILLEGIB

MEMORANDUM FOR: Chief, Technical Performance Division, TSSG

SUBJECT : Design Problems on [] Chip Comparator []

Design problems concerning the [] Chip Comparator
are described in two attachments. It is recommended that they be
brought to the attention of the Development Engineering Division, TSSG.

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Chief, Equipment Performance Branch, TPD

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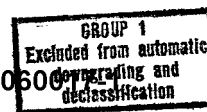
ATTACHMENTS: 1 - Lamp Cooling Problem
2 - Collimation Problem with
[] Stereoviewer head

X1

Distribution:
Orig & 1 Addressee
2 TPD/EPB

Declass Review by NGA.

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ATTACHMENT 1

 CHIP COMPARATOR

Lamp Cooling Problem

K1 The Chip Comparator uses an Hg 198 light source for each of its two interferometers. The temperature of each lamp is controlled by a cooling coil around it. Water flows in a closed circuit from a plastic two quart reservoir, through a plastic hose to a temperature control copper coil around the lamp, and back to the reservoir for recirculation. If the water does not flow through the coil, the lamp will overheat quickly and its life will be reduced, or the lamp will be damaged permanently, depending on the time interval without cooling.

On 13 September 1968, a leak developed in the reservoir for the "Y" axis of the Comparator in IAS. Water leaked on components of the lamp cooling system causing the fuse that controls both water pump circuits to blow. The water flow in each axis stopped and the lamps overheated. This was detected only after the mensuration counters stopped functioning and water appeared on the floor.

Since the cost of each lamp is approximately and their replacement is a time consuming operation, it is recommended that an interlock be designed and installed on all the Chip Comparators so as to prevent the lamp from operating, if the cooling system malfunctions.

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GROUP 1
Excluded from automatic
downgrading and
declassification

CHIP COMPARATOR

Collimation Problem with the
High Power Stereoviewer head used
on the Chip Comparator

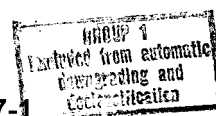
The High Power Stereoviewer was designed for the stereoscopic examination of high resolution film. It consists of two Dynazoom Microscopes mounted on a common base and optically bridged, with the viewer head, for stereo. Each side has an elevating viewing stage which is used for focusing the imagery.

When the Chip Comparator was designed, the stereo head from the High Power Stereoviewer was selected for the viewing function. The head is mounted on a supporting arm, holding it over the two viewing stages. It is raised and lowered to focus the imagery on the stages, while the stages are used only for X and Y scanning. It is absolutely necessary that the head be precisely collimated with the two viewing stages, in order to maintain both stages in focus at the same time.

The Equipment Performance Branch has received several complaints concerning the focusing of the stereo head on the chip comparators. On all occasions, the operators complained that both stages could not be focused at one time, indicating the stereo head was out of collimation.

EPB has responded to the trouble calls and collimated the stereo head, but has found this adjustment, which is the only one provided, to be unsatisfactory. It is unsatisfactory because there is approximately .007 inch play from side to side in the dove tail slide guiding the head movement up and down. The head is mounted to these two dove tail slides by a single plate, and this plate has four Allen screws which hold the stereo

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head. The collimation adjustment is made by loosening the Allen screws, leveling the head, and retightening the screws.

Because of the play in the dove tail slide, it is impossible for the head to remain in collimation. Any contact with the stereo head by the operator, for minor adjustments, will cause loss of collimation. As an example, the IAS Chip Comparator was collimated three times on 9 September 1968, with a loss of collimation each time, after operator adjustments. These adjustments involved either rotation of the objective lens nosepiece or a change in position of the image rotation control and are all normal for operation of the instrument.

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Chip Competitors

2	DIA	(DOD)
1	IEG	(R+D)
1	IAS	(R+D)

Who pays most for first mod. - IEG